

CLAIMS:

1. An antenna unit adapted to be connected to an electronic device for transmitting a received radio signal to the electronic device, said antenna unit comprising:

an antenna configured to receive a radio signal;

a signal processing module configured to convert the radio signal received by said antenna into signal data to be transmitted to the electronic device;

a substrate configured to carry said antenna and said signal processing module, said substrate having a circuit ground forming a ground of said signal processing module;

a terminal interface configured to have an array of terminals for electrical connection with the electronic device, said terminal interface including a ground line leading from a ground terminal provided in the array of terminals to the circuit ground;

an electromagnetic shield configured to surround said signal processing module so as to electromagnetically isolate the signal processing module from the antenna, said electromagnetic shield being electrically connected to the circuit ground;

a case made of insulating resin, said case being configured to accommodate said antenna, said substrate, said signal processing module, said terminal interface, and said electromagnetic shield while exposing said array of terminals;

wherein said antenna unit includes a noise canceller for canceling noise generated in the electronic device and transmitted to the circuit ground through the ground line,

said noise canceller comprising a conductive stub piece one end of which is electrically connected to said electromagnetic shield and the other end of which is a free end, said stub piece having a length of about 1/4 of a

wavelength of the radio signal.

2. The antenna unit as set forth in claim 1, wherein said stub piece is made of a wire.

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3. The antenna unit as set forth in claim 1, wherein said stub piece is formed by cutting a part of said electromagnetic shield and bending it.

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4. The antenna unit as set forth in claim 1, wherein said stub piece is a rod member which is extendable relative to said case.

5. The antenna unit as set forth in claim 1, wherein said stub piece is a rod member,

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said case having a receptacle on an outer bottom of it whose inner surface is electrically connected to said electromagnetic shield, one end of said stub piece being inserted into said receptacle and electrically connected to said electromagnetic shield through the inner surface of said receptacle.

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6. The antenna unit as set forth in claim 1, wherein said stub piece is a rod member one end of which is pivotally supported on the outer bottom of the case.

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7. The antenna unit as set forth in claim 1, wherein said stub piece is in a form of a flat plate.

8. The antenna unit as set forth in claim 7, wherein

said stub piece is disposed on an outer bottom of the case and provided with a vertical plate which electromagnetically insulates said antenna unit

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from the electronic device when said antenna unit is connected to the electronic device.

9. The antenna unit as set forth in claim 7, wherein

5 said stub piece is in a form of a fan,
said noise canceller comprising two or more said stub pieces,
one end of each of said stub pieces being pivotally supported on an outer
bottom of said case.

10 10. The antenna unit as set forth in claim 1, wherein

said electromagnetic shield is disposed on an inner bottom of the case,
said antenna unit further comprising a plate which is capacitively coupled to
said electromagnetic shield through a bottom of the case,
one end of the stub piece being connected to said plate and said stub piece
15 being electrically connected to said electromagnetic shield through said
plate.

11. The antenna unit as set forth in claim 10, wherein

said plate is attached to an outer bottom of the case,
20 said stub piece being formed by cutting a part of said plate and bending it.

12. The antenna unit as set forth in claim 10, wherein

said stub piece is insert-molded into said case together with said plate.

25 13. The antenna unit as set forth in claim 10, further comprising
a sheet member attached to an outer bottom of said case,
said plate and said stub piece being formed in said sheet.

14. The antenna unit as set forth in claim 10, further comprising

30 a case cover attached to an outer bottom of the case,

said plate and said stub piece being insert-molded into said case cover.

15. The antenna unit as set forth in claim 10, wherein
said plate is attached to an outer bottom of said case,

5 said stub piece being in a form of a flat plate extending from said plate.

16. The antenna unit as set forth in claim 15, wherein
said plate is provided with a vertical plate which electromagnetically
insulates said antenna unit from the electronic device when said antenna
10 unit is connected to the electronic device.

17. The antenna unit as set forth in claim 15, wherein
said plate and said stub piece are a fan-shaped plate,

said noise canceller comprising two or more said fan-shaped plates,

15 one end of each of said fan-shaped plates being pivotally supported on the
outer bottom of the case.